**FORT WAYNE REDUCTION DUMP**
**Fort Wayne, Indiana**

**FIVE YEAR REVIEW REPORT**

Prepared by:
Indiana Department of Environmental Management
In Coordination With
U.S. Environmental Protection Agency
Region V

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Date

## I. PURPOSE

The Indiana Department of Environmental Management (IDEM) has conducted a statutory Five-Year Review of the Remedial Action (RA) being implemented at the Fort Wayne Reduction (FWR) site in Fort Wayne, Indiana. This review was intended to evaluate whether the RA is protective of public health and the environment, and will become part of the Administrative Record for the site. The public can review the Administrative Record at the Allen County Public Library, 900 Webster Street, Fort Wayne, Indiana.

Section 121(c) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and Section 300.430(f)(4)(ii) of the National Oil and Hazardous Substance Contingency Plan (NCP), require that periodic (no less often than every five years) reviews are to be conducted for sites where hazardous substances, pollutants, or contaminants remain at the site above levels that will not allow for unlimited use or unrestricted exposure following the completion of all remedial actions for the site.

OSWER Directive 9355.7-02 (Structure and Components of Five-Year Reviews, May 23, 1991) provides that EPA will conduct a Statutory Review of any site at which a post-SARA remedy, upon attainment of the Record of Decision (ROD) cleanup levels, will not allow unlimited use and unrestricted exposure; also, Statutory Five-Year Reviews are required no less often than each five years after the initiation of the RA. Further, OSWER Directive 9355.7-02A (Supplemental Five-Year Review Guidance, July 26, 1994) directs the EPA to conduct one Five-Year Review for sites with multiple remedies or operable units and that the Five-Year Review will be triggered by the first operable unit.

EPA has established a three-tier approach to conducting five-year reviews, the most basic of which provides a minimum protectiveness evaluation (Type I Review). EPA determines the level of review based on site-specific considerations, including the nature of the response action, the status of on-site response activities, and the proximity to populated areas or sensitive environmental areas. A Type I review was conducted at the FWR site, and consisted of: (1) review of all documents and data associated with the RA; and (2) a site visit.

SCA Services, Inc. contracted RUST Environment and Infrastructure to perform the RA in accordance with a Consent Decree entered in the United States District Court for the Northern District of Indiana on July 18, 1989. The EPA and IDEM were signatories to the Consent Decree. Three operable units were developed for the FWR site: (1) the municipal landfill (eastern portion); (2) the soil on the western portion of the site; and (3) ground water. The major components of the selected remedies for the three operable units are described in Section III of this document.

## A. SITE BACKGROUND

The FWR site is located along the south bank of the Maumee River approximately 1.1 miles east of the U.S. Highway 30 and Maumee River intersection, just east of Fort Wayne, Indiana. The 35 acre site is situated within the 100-year floodplain of the river and is located in the vicinity of other abandoned landfills. Currently, primary land use in the area of the site is light industrial and commercial.

Prior to 1967, the site was uncultivated farmland. From 1967 to 1976, residential and industrial wastes were disposed of at the site. Few records were kept on the volume and composition of wastes, or on the generators of the waste. The eastern portion of the site (approximately 15 acres) was used as a municipal/general refuse type landfill. The western portion (approximately 5 acres) was used as a disposal area for industrial wastes, wire waste, and residual ash from incinerator operations that occurred on-site between 1967 and 1970. In addition, liquid wastes were disposed of in an open pit on the western portion of the site.

The site was proposed for addition to the National Priorities List (NPL) in October of 1984, and was finalized on the NPL in June of 1986.

## B. RESULTS OF SITE INVESTIGATIONS

The Remedial Investigation (RI) report, dated January 7, 1988, indicated that the site consisted of to characteristically different areas: the eastern portion (municipal waste/general refuse) and the western portion (industrial waste, wire waste, liquid waste, incinerator ash):

1. Eastern Portion - Surface and Subsurface Soils

The soils in the eastern portion of the site contained municipal wastes buried up to 25 feet deep and covered with a mixture of clay, silts, and gravels averaging approximately 2 feet in thickness. The soils on this portion of the site, were not a source of hazardous organic contaminants. Some inorganic compounds, specifically arsenic, antimony, copper, and lead, were detected in the surface soils at levels up to 195 mg/kg.

The ground water beneath the site has been delineated into three unconsolidated aquifers (deep, intermediate, and upper) with intervening low permeability layers. Under the far eastern portion of the site, the intermediate aquifer has direct hydraulic connection with the upper aquifer unit. The general flow direction of ground water under the eastern portion of the site is northeast toward the Maumee River. No contaminants were found to occur in the ground water beneath the eastern portion of the site above risk-based limits for the river.

2. Western Portion - Surface and Subsurface Soils

Soils in the western portion of the site were found to be contaminated with volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), PCBs, and inorganics. Sample results for total volatile organic compounds were as high as 15,566,000 ug/kg on this portion of the site. Also, two areas of buried drums were discovered on the western portion of the site. The ground water underneath the site, as previously stated, was delineated in three separate aquifers (deep, intermediate, and upper). The upper aquifer consists of alluvial and lacustrine deposits and is underlain by a till unit. The general flow direction of ground water under this portion of the site is north and northeast towards the Maumee River. The RI shows that ground water contamination under the western portion of the site is limited to the upper aquifer. Total organic contaminant concentrations as high as 1,700 ug/L were found in the ground water beneath this portion of the site.

3. Contaminants of Concern

Ninety-one chemicals were detected in samples collected during the RI. Since it was not feasible to include all of them in the risk assessment for the site, potential chemicals of concern were selected to represent the hazards the site may pose to human health and the environment. The following are the forty-three potential chemicals of concern listed in the ROD:

| | |
|---|---|
| Acetone | Lead |
| Antimony | Manganese |
| Arsenic | Mercury |
| Barium | 2-Methylphenol |
| Benzene | 4-Methylphenol |
| Beryllium | 4-Methyl-2-Pentanone |
| Bis(2-ethylhexyl)phthalate | Nickel |
| Cadmium | PAHs* |
| Chlorobenzene | PCBs |
| Chloroform | Phenol |
| Chromium | Silver |
| Copper | Tetrachloroethene |
| Cyanide | Toluene |
| Dibutyl phthalate | 1,1,1-Trichloroethane |
| 1,1-Dichloroethane | Trichloroethene |
| 1,1-Dichloroethene | Vanadium |
| 2,4-Dimethyl phenol | Vinyl Chloride |
| Methylene Chloride | Xylenes |
| Ethylbenzene | Zinc |

* Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-c,d)pyrene

The ROD for this site created the following three operable units:

A. EASTERN PORTION OPERABLE UNIT

This operable unit was that part of the site which was used as a municipal waste/general refuse landfill. The major components of the selected remedy include:

1) Access restrictions (fencing and deed restrictions);
2) Soil cover designed for flood protection;
3) Installation of new ground water monitoring wells; and
4) Long-term ground water monitoring.

The endangerment assessment for this area did not indicate that the contaminants present posed a threat by either direct contact with the surface soils or by migration of ground water to the Maumee River. Construction of the soil cover and installation of the monitoring wells were completed in 1994. The soil cover consists of three soil layers. The lower layer is a 30 inch thick area of clay compacted to a permeability of $1 \times 10^{-7}$ cm/sec. The middle layer is a general fill soil area to provide frost protection for the clay and to allow for grading to promote runoff of precipitation. The surface layer of topsoil, promotes growth of vegetation. Topsoil on steep slopes were covered with erosion control matting to prevent excessive erosion prior to the vegetation taking root. Rip-rap was placed from the river channel to the 100 year flood level. The monitoring wells were sampled semi-annually in 1993 and 1994.

B. WESTERN PORTION and GROUND WATER OPERABLE UNITS

These operable units were combined in the remedy description portion of the ROD, because the ground water on the western portion required treatment and ground water on the eastern portion did not. The western portion of the site is where industrial, wire, liquid, and incinerator wastes were deposited. A large pit where liquid wastes were dumped was also located in this area, as was an area of buried drums. The primary components of the selected remedy for these operable units are:

1) Access restrictions (fencing and deed restrictions);
2) A slurry wall between the western portion and the Maumee River;
3) Ground water collection and treatment;
4) Excavation and incineration of buried drums;
5) Reconsolidation of soils/wastes on-site;
6) A soil cover; and
7) Flood protection and wetlands protection.

The construction of these operable units is substantially complete, but a final RA Report has not been submitted. The excavation of buried drums began in 1993 and was completed in 1994. Two areas of buried drums were excavated during the course of this action. A total of 22,579

drums containing material were recovered. Additionally, 5,671 empty drums were recovered. The drums, upon excavation, were sampled and stored on-site. When sample results were received, the drums were emptied into roll-off boxes (if solid material) or storage tanks (if liquid) on-site. The roll-off boxes and storage tanks were then taken off-site for proper disposal. The empty drum carcasses were crushed and then placed back into the excavation areas. The western portion was then capped with a RCRA hybrid soil cover, which consisted of a general fill layer for grading proper slopes, a cohesion soil layer ranging from 2.5 feet to 3 feet thick (depending on slope) and a layer of topsoil to promote vegetation growth. A geotextile layer was placed under the soil cover along that portion of the area bordered by the Maumee River, and rip-rap was placed on top of the soil cover along the Maumee River. Rip-rap was also placed in drainage swales that were constructed along the eastern and western boundaries of the operable unit area. The slurry wall was installed between the western portion of the site and the Maumee River.

The ground water operable unit consists of a collection trench located slightly upgradient of the slurry wall, three ground water extraction wells (which are located in the collection trench), and a ground water treatment building located on the far southwest area of the site. The extraction wells pump water to a 20,000 gallon capacity storage tank located behind the treatment plant building via pipes placed underneath the soil cover in the western portion of the site. Water from this tank is then pumped inside the treatment plant building to a low-profile air stripper and two granular activated carbon (GAC) units. The collected water flows first through the air stripper, then the GAC units. This treated water is then pumped to a second 20,000 gallon storage tank located behind the treatment plant building. The treated water is then sent off-site via a sanitary sewer line to the City of Fort Wayne Wastewater Treatment Plant for final treatment. The on-site treatment system is computer controlled, and an auto-dialer immediately notifies contractor personnel should a problem develop.

On September 25, 1995, U.S. EPA and IDEM conducted a prefinal inspection of work performed by the responsible party. U.S. EPA determined that the responsible party constructed the remedy in accordance with remedial design plans and specifications. On September 27, 1995, U.S. EPA signed a Preliminary Close Out Report (PCOR) for the site. The PCOR documents that construction activities have been completed in accordance with OSWER Directive 9320.2-3C. To date, the final Remedial Action Report for the site has not been submitted.

## IV. REMEDIAL OBJECTIVES

### A. EASTERN PORTION OPERABLE UNIT

Since no unacceptable public health or environmental risk was associated with this area, the remedial action objectives were to ensure that future migration of ground water will not present a threat to the Maumee River and that adequate cover is present to prevent erosion resulting in a direct contact threat or washout of waste to the Maumee River.

B. WESTERN PORTION OPERABLE UNIT

The objectives of the remedial action for this operable unit were to:

1) Provide adequate protection of public health and the environment by limiting the threat of direct contact with contaminated soils;
2) Limit the erosion of on-site soils; and
3) Remove the buried drums to reduce to source of ground water contamination.

C. GROUND WATER OPERABLE UNIT

The objective of the ground water remedial action was to provide adequate protection of the public health and environment by limiting the discharge of, and direct contact with, ground water or ground water seeps in the western portion of the site.

## V. APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS REVIEW

OSWER Directive 9355.7-02A states that for sites where a remedial action is not complete, the review of applicable or relevant and appropriate requirements (ARARs) as part of a Five Year Review is not necessary. Since a final RA Report has not been submitted, the RA is not considered completed for this site. In addition, baseline water quality data will be evaluated for the site to establish ground water protection standards to protect the Maumee River, in the event of future modifications to the current ground water management system.

## VI. SUMMARY OF SITE VISIT

The Fort Wayne Reduction site was visited on March 1, 1999 by U.S. EPA's Remedial Project Manager. The purpose of the site visit was to determine the current status of the site and to evaluate site conditions following flooding of the Maumee River. The fence around the site was intact and not damaged. The soil covers on both the eastern and western portions were vegetated. Flooding from the Maumee River in January 1999 caused minor erosion around one of the ground water extraction wells. This flood damage did not appear to have compromised the integrity of the soil covers; repair of the damage will be conducted by the site contractor. No areas of water ponding on the surface of the landfill (eastern or western portion) were observed. No ground water seeps were observed on the soil covers or along any portion of the Maumee River. No water leaks were observed from the onsite water treatment building. Ground water monitoring wells were capped, locked, and appeared intact. No damaged well casings were noted.

Based on the March 1, 1999 inspection, it appears that the soil covers and fencing on the eastern and western portions of the site, and the ground water collection and treatment system on the western portion, are operating as designed. Review of the ground water monitoring data for the eastern portion of the site indicated that no contaminants above risk based levels are reaching the Maumee River from this portion of the site. Ground water monitoring wells were installed in March 1996 for Post-Construction Monitoring related to the performance of the collection trench, vertical barrier and soil cap. The Quality Assurance Project Plan for Post-Construction Monitoring has been reviewed by U.S. EPA and is undergoing revision by the PRPs. Subsequent to QAPP approval, ground water monitoring will be performed during the Summer of 1999. Data will be reviewed to ensure that the implemented remedy remains protective of human health and the environment.

## VII. RECOMMENDATIONS

To ensure continued protection of human health and the environment, the following activities should continue and/or be completed at the site:

1) Continue operation and maintenance activities for all operable units, including the collection of ground water from the site, pretreatment of ground water, with subsequent discharge to the City of Fort Wayne sanitary sewer system;
2) Continue ground water and treatment plant effluent monitoring;
3) The performance goals of the collection system are to collect ground water prior to discharge into the Maumee River and reduce infiltration into the collection system from the river recharge. The ground water cleanup objectives are to provide adequate protection of human health and the environment by limiting discharge of, and direct contact with, contaminated ground water and ground water seeps. The length of operation of the collection system is related to the ground water cleanup objectives for the site. In the event of future modifications to the collection system, ground water cleanup objectives will be developed to protect the Maumeee River based on the following criteria:
    a) No statistically significant increase in constituents related to ground water discharge from the site will be released to surface water; and
    b) No statistically significant exceedance of the State of Indiana Water Quality Standard for Surface Water resulting from ground water discharge from the site will be allowed.
4) The Remedial Action Report should be submitted for the site;
5) Modify the QAPP, with subsequent U.S. EPA approval for continued monitoring;
6) Repair the minor erosion around the ground water extraction well which resulted from the Maumee flooding.

## VIII. STATEMENT OF PROTECTIVENESS

Based on the site visit and the review of ground water monitoring data for the eastern portion of the site, the remedy for the eastern portion of the site appears to provide adequate protection of human health and the environment. While clean-up standards for the ground water have not yet been established, the selected remedies for all three operable units appear to be operational and functional. The ground water collection system on the western portion of the site was designed to protect the Maumee River from the migration of contaminated ground water into the Maumee River at unprotective levels. Ground water monitoring data will be collected and reviewed to evaluate the protectiveness of the remedy for the western portion of the site during the Summer of 1999.

## IX. NEXT REVIEW

The expectation exists that hazardous substances, pollutants, or contaminants will remain at the Fort Wayne Reduction site which will not allow for unlimited use or unrestricted exposure. This will require the U.S. EPA to conduct another Five-Year Review by April, 2004. This review will be, at minimum, a Level 1 Review, consisting of reviews of all ground water monitoring data from the eastern and western portions of the site, a site inspection, and review of all newly promulgated environmental laws.

Attachments
Figure 1 - Location Map
Figure 2 - Site Map

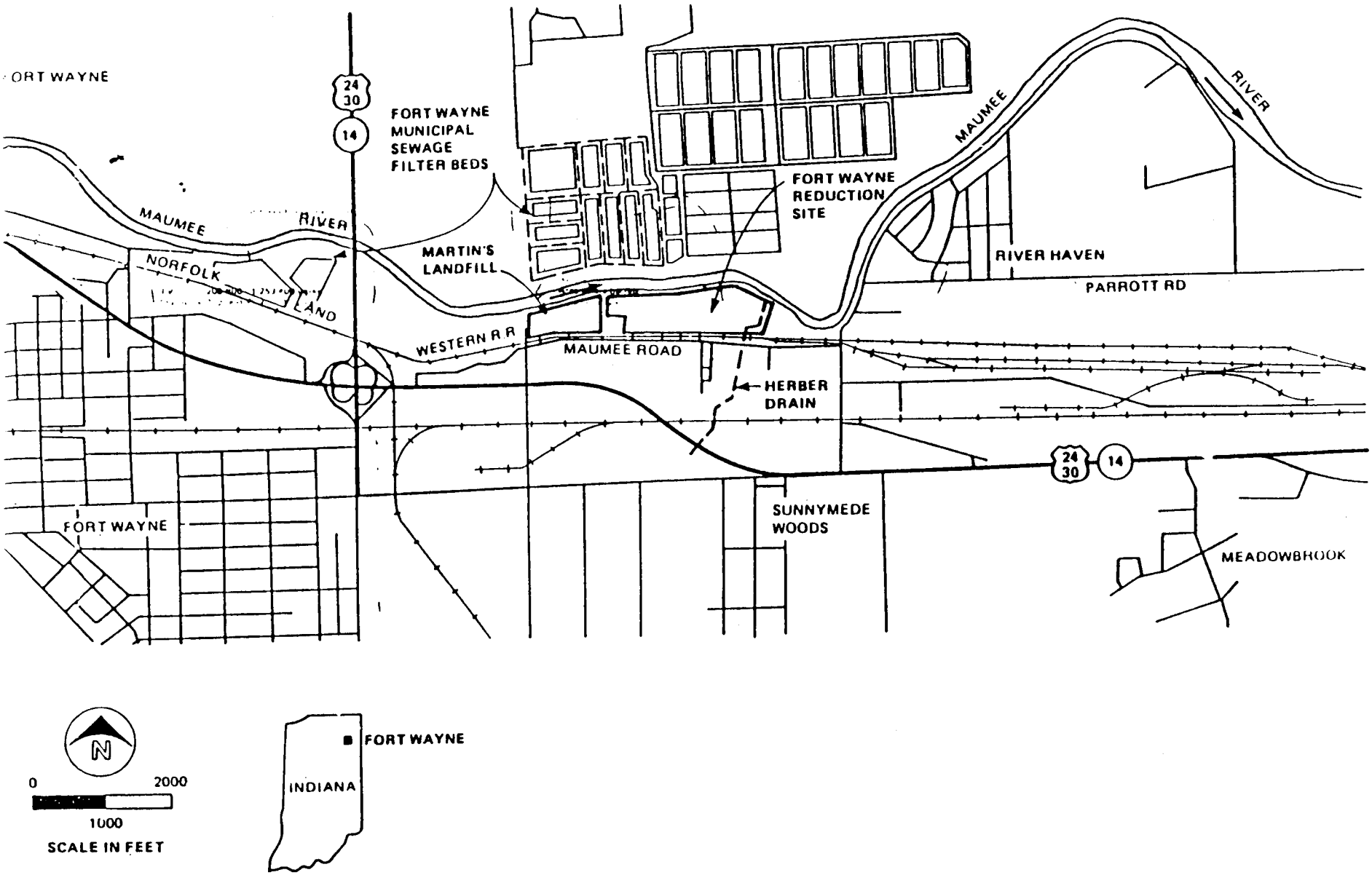


**FIGURE 1**
**LOCATION MAP**
**FT. WAYNE REDUCTION FS**

**SOURCE: Fort Wayne East USGS Quadrangle map.**

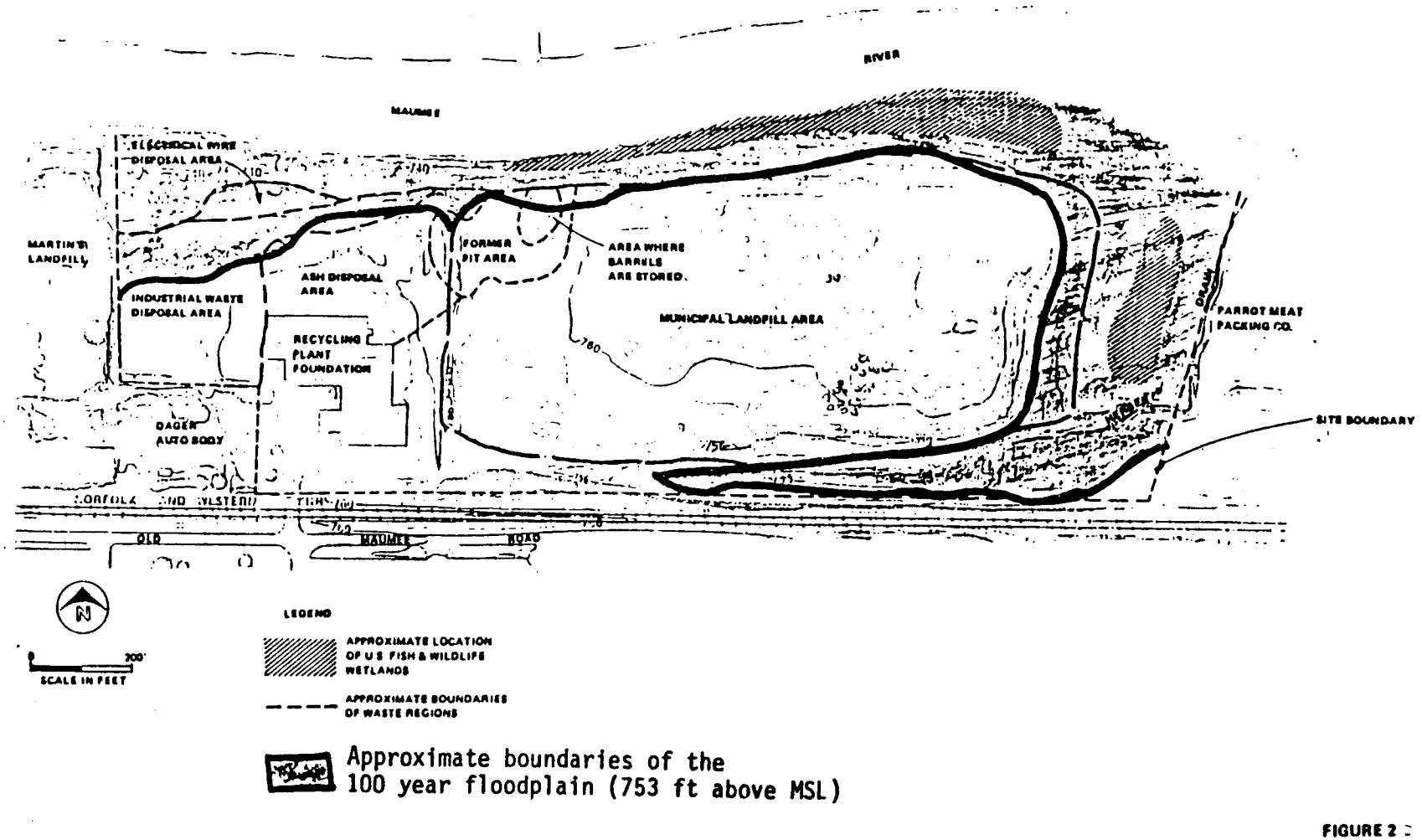


**FIGURE 2**
**SITE MAP**
FT WAYNE REDUCTION